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have learned that Zentmeyer does make glasses, and that one of the Tolles' stands which he had seen was furnished with an excellent objective by Zentmeyer. In the notice of Zentmeyer's stand the most important and characteristic features are entirely unnoticed!

In his notice of Grunow's instruments he particularizes an inverted microscope, the peculiarity of which was a movement by friction rollers, an invention of Tolles, and which he (Hagen) had seen various modifications of on several of Tolles' instruments, in particular the first one in which it was ever introduced; yet he failed to notice it there.

It may, perhaps, be urged for Dr. Hagen that these things are trivial, and to some they may look so; but they constitute Dr. Hagen's paper; the aggregate of the trivialities makes about the whole. Dr. Hagen fails throughout all his papers to appreciate the difference between magnifying power and quality.

With a patronizing air that is "nearly comical," after reading the paper, he compliments the artists in these words: "Messrs. Tolles and Wales are no doubt artists of the first water, constantly endeavoring to advance and enlarge their science."

Dr. Hagen admits that he has not exhausted his subject, and promises to renew it; it is to be hoped that he will, and that when he does he will spare no pains to make himself thoroughly acquainted with it; if he endeavors to do that, all our microscopists will cheerfully assist him.—C. S.

ALASKA AND ITS RESOURCES.* It is not often that an exploration is able to show such results as Mr. Dall places before the public in this volume, even when assisted by public means. We cannot, therefore, praise too highly the modest manner in which the author tells us that he was unwilling to have the plans of the former director, Major Kennicott abandoned, and therefore, undertook to carry out the remainder of the explorations which were only half completed when the telegraph company abandoned the enterprise. The author was thus left alone for one year and succeeded in completing the survey of the Yukon Valley, unassisted except by the natives. As a thorough and reliable account of Alaska, with its pictures of subarctic nature, the substantial volume before us, with its beautiful illustrations, typography, paper and binding, will claim the highest rank and retain it for years to come. We feel proud of this elegant book, and that it is the fruits of American pluck, enthusiasm, and scientific zeal.

Many of the scientific results obtained by Mr. Dall have been already published in the NATURALIST, and the great value of his discoveries in a single department of zoology, *i.e.* that of ornithology, were passed in review in the last number by an able naturalist. In reading over the plain, unvarnished, modest narrative of personal adventure and explorations in Alaska, we are struck by the earnest endeavor of the author to

* By William H. Dall. Lee and Shepard, Boston, 1870. 8vo, pp. 627. With a map and numerous illustrations. \$7.50.

make his statements thoroughly reliable. Alaska is in most respects a new country,—the hand of civilized man has scarcely made its mark on the face of nature, the Indians and Innuits will soon disappear, domesticated and introduced species of animals and plants have scarcely taken up their abode and begun to wage war against the native species, and just at this juncture the record of a naturalist who has watched the changes of each season for two years in succession is a contribution of the first importance to science.

The first half (Part I) of the book is a personal narrative of travels on the Yukon River and in the Yukon territory, the first year as Director of the Scientific Corps of the Western Union Telegraphic Expedition; the second year he remained after the expedition returned, and prosecuted his explorations alone and at his own expense. The second part treats of the geography, history, inhabitants, and resources of Alaska.

In reading the narrative we occasionally meet with a paragraph of general interest to our readers. Let the author give us his first impressions of the Yukon :

"Passed over (p. 41) the flanks of some high hills, from one of which I caught my first glimpse of the great river Yukon, broad, smooth, and ice-bound. A natural impatience urged me forward, and after a smart tramp of several miles we arrived at the steep bank of the river. It was with a feeling akin to that which urged Balboa forward into the very waves of a newly discovered ocean, that I rushed by the dogs and down the steep declivity, forgetting everything else in the desire to be first on the ice, and to enjoy the magnificent prospect before me.

There lay a stretch of forty miles of this great, broad, snow-covered river, with broken fragments of ice-cake glowing in the ruddy light of the setting sun; the low opposite shore, three miles away, seemed a mere black streak on the horizon. A few islands covered with dark evergreens were in sight above. Below, a faint purple tinged the snowy crests of far-off mountains, whose height, though not extreme, seemed greater from the low banks near me and the clear sky beyond. This was the river I had read and dreamed of, which had seemed as if shrouded in mystery, in spite of the tales of those who had seen it. On its banks live thousands who know neither its outlet nor its source, who look to it for food and even for clothing, and, recognizing its magnificence, call themselves proudly *men of the Yukon*.

Stolid indeed must he be, who surveys the broad expanse of the Missouri of the North for the first time without emotion. A little Innuit lad, who ran before the dogs and saw it for the first time, shouted at the sight, saying, amidst his expressions of astonishment, 'It is not a river, it is a sea!' and even the Indians had no word of ridicule for him, often as they had seen it."

The anthropologist will glean much valuable information from the narrative, while the second part on the manners and customs of the natives, is an important contribution to American anthropology. On page 127, in describing the Innuit casine, or town hall, it is stated that

"There is not a nail or a pin in the whole structure, which is of the most solid description. Some of the logs are two feet in diameter, and the broad seats on both sides, previously referred to, are each composed of a single plank forty-four inches wide, thirty feet long, and four inches thick. These enormous planks are from drift logs, and were hewn with the stone axes of the natives."

Of the bears, the number of North American species of which is now in dispute :

"There are three species: the large brown bear of the mountains, known as the 'grizzly' among the Hudson Bay voyagers; the barren-ground bear (*Ursus Richardsonii* of Mayne Reid), which is confined in Russian America to the extreme north-east; and the black bear,

which frequents the vicinity of the Yukon, in the woody district only. The polar or white bear is found only in the vicinity of Behring Strait, on the shores of the Arctic Ocean, and on St. Matthew's Island in Behring Sea. It has probably reached the latter locality on floating ice; we only know of its existence there from whalers, who apply the name of Bear Island to the locality, from the abundance of these animals. We know that it is not found on the mainland south of latitude sixty-five degrees. The cubs of the black bear are of the same color as the parent, and the adult is very much smaller than its brown cousin, which sometimes reaches a length of nine feet, with a girth nearly as great. The brown bear, or grizzly, is the only one which manifests any ferocity, and it always avoids any contest unless brought to bay."

Regarding the remains of the extinct elephant (*Elephas primigenius*), which are not uncommonly found on the surface, the author says:

"I picked up near the village a large portion of the skull of the extinct elephant (*Elephas primigenius*). These bones are not so common as the teeth and tusk, being found on the surface only, and usually much decayed: while the bones of the musk-ox and fossil buffalo found in the same situations are much better preserved, and sometimes retain some of the animal matter in the bone. The natives have no tradition of any other large animal than the reindeer and moose, and regard the elephant and musk-ox bones as the remains of dead 'devils.' The tusks are not so well preserved as those found in Siberia, which are usually buried in the earth. The former are blackened, split and weathered, and contain little ivory in a state fit for use, though the Innuitt of the Arctic coast occasionally find them in such preservation that they make kantags or dishes of the ivory, according to Simpson."

The chapter on the geography of Alaska gives a full account of the general topographical features of the territory, and many useful details with regard to the navigation of the shores and adjacent islands. This is a very perfect summary of all that is known of the physical history of this portion of the North Pacific, and it shows us, also, perhaps the most important result of the expedition. This was the demonstration of the cessation of the Rocky Mountains, at a point about one hundred and fifty miles south-east of Fort Yukon.

"The Rocky Mountain chain extends east of the basin of the Yukon, between it and the Mackenzie, as far north as latitude 64°. Here it bends westward, and, becoming broken, passes to the west and south, combining with the coast ranges to form the Alaskan range." This last follows the shore line to the westward, and thus the only considerable exception to the orographic law that mountain chains trend in the same direction with the coast seems to be explained, and geographers can no longer lay down the northern extension of the Rocky Mountain as reaching to the shores of the Arctic Sea. The fauna of the Yukon is almost wholly Eastern Canadian, showing that the mountains had interposed no insuperable barrier to the north as they had to the south of the Alaskan and west of the Rocky Mountains proper.

The soil of the Yukon Valley is always frozen at the depth of three or four feet, and in some cold situations remains icy near the surface. "This layer of frozen soil is six or eight feet thick." "This phenomenon appears to be directly traceable to the want of drainage, combined with the non-conductive covering of moss," which prevents thawing in the summer heats. Nevertheless this frozen soil has "a healthy and luxuriant vegetation, bearing its blossoms and maturing its seeds as readily as in situations apparently much more favored."

But next in value to the geographical details are the many authentic

facts regarding the natives now so rapidly disappearing. By learning to speak their language, and living among them, his testimony is of special value, and he says that he was enabled to correct many erroneous impressions formed early in his visit to the country, by more careful and repeated observations and knowledge of their language. Of the Esquimo he made a special study, and cautiously remarks (on p. 154) that "it is impossible to doubt that among all American aborigines, much in their mode of life, customs, and ceremonials is of a local nature, and due to extraneous circumstances. Much is also due, unquestionably, to the similarity of thought and habit which must obtain among human beings of a low type, and who gain their living by similar means. Hence, a general similarity of many customs may naturally be expected between both Innuit and Indians, as well as for distant aborigines of different parts of the world, and this similarity can afford no basis for generalizations in regard to their origin."

As regards their affinities, he writes: "It should be thoroughly and definitely understood, in the first place, that they are not Indians; nor have they any known relation, physically, physiologically, or otherwise, to the Indian tribes of North America. Their grammar, appearance, habits, and even their anatomy, especially in the form of the skull, separate them widely from the Indian race. On the other hand, it is almost equally questionable whether they are even distinctly related to the Chukchees and other probable Mongolian races of the eastern part of Siberia" (p. 137). As to the origin of the word Eskimo we are told that "the Indians call the Innuit and Eskimo *Uskeémi*, or sorcerers. *Kagus-keémi* is the Innuit name for the Casines, in which their Shamáns perform their superstitious rites. From this root comes the word Eskimo."

In the chapter on the aboriginal inhabitants of Alaska, he begins by dividing the inhabitants into Indians and *Orarians*, the latter embracing the tribes of Innuit, Aleutians and Asiatic Eskimo. The author is inclined to reject the theory most in vogue that America has been peopled from Asia or Polynesia, and "proposes to attempt to show that so *few* of the facts which have been used in support of this hypothesis are susceptible of quite another interpretation. I refer to the existence of tribes of Orarian stock on the coast of the Chukchee Peninsula," which were originally derived from America, their emigration having taken place within three hundred years. He adds beyond that "there is no doubt but that the Aleutians originally emigrated to the islands from the American continent, driven by hostile tribes. The Innuit formerly extended farther south than they do now, and in this connection we find the suggestive remark that "Dr. Otis, of the United States Army Medical Museum at Washington, who has handled as many aboriginal American crania as any northern ethnologist, says that the skulls found in the northern mounds have the same peculiarities which distinguish all Orarian crania, and that both are instantly distinguishable from any Indian skulls."

The chapters on the climate and agricultural capabilities and geology,

and the whole tenor of the remarks on this subject leads the reader to the belief that the purchase of Alaska was wisely made by our government.

TROUT CULTURE.*—This is just the book that has been wanted by every one interested in the raising of fish by artificial propagation. It contains a statement of the experience of the most successful fish breeder in the country, presented in concise and forcible language; every word fully convincing the reader that the author is simply giving the results of his experience, with the earnest desire of furnishing others with all the information necessary for them to become as successful breeders of trout as himself. With this book in hand, and a proper location and supply of water, there is no reason why trout raising should not succeed in the hands of any careful and energetic person. In fact nothing but pure carelessness could make it fail, though, like all other stock raising operations there are many things that should be looked after before the eggs are placed in the hatching house; and as no sheep raiser would purchase five hundred sheep for his farm unless he had what he knew to be sufficient pasture for so large a number, so no trout raiser should purchase his five hundred or more trout eggs unless he has plenty of good water. We have not space for the extended review of this little work which our interest in the subject would otherwise lead us to make, and can only say that every point is fairly and plainly presented, from the location of the pond, its best depth and shape, its bottom, its screens and water supply; to the transportation of eggs and live fish; and all the intermediate operations of procuring the eggs in different ways, the construction of the hatching house, handling the eggs and young fish; with observations on their diseases and enemies; careful statements regarding the amount of water required for each fish of different ages, etc., etc. In fact every information that long continued and successful operations enables the author to feel confident is just what beginners want, is here given. An improved spawning screen, invented by Mr. Collins (Mr. Green's partner), is described and figured. This screen or box is so designed as to secure the eggs of trout and other fishes that have been spawned in a natural way, and is a most convenient and labor saving contrivance for the trout breeder. We hope to give a communication on this subject in a future number.

There are several facts very interesting to the naturalist alluded to by Mr. Green. The average age of a trout he thinks to be about twelve or fourteen years, and that trout are in their prime during the age of from three to ten years. Mr. Green also states that trout will *not* live in water the temperature of which is above 68°, and do best at a temperature of 48°.

On the last page of the book Mr. Green calls attention to a "worm"

* *Trout Culture.* By Seth Green. 12mo pamph., pp. 92. Green and Collins, Caledonia, New York. [For sale at the Naturalists' Agency, Salem. Price \$1.00.]